X-Series EX/MX Maintenance

Offering a Range of Configurations Designed for Low-cost Testing

Automotive

Mobility

IoT/IoV & Optoelectronics

Computing & Network

Industrial & Medical

Consumer

Course Description

The X-Series EX/MX Maintenance training course provides a comprehensive overview of the hardware available in the EX/MX test system. The course focuses on the preventative maintenance procedures and troubleshooting activities needed to ensure maximum system uptime. This course also covers the operation of the diagnostic interface and hardware functionality. The attendees will become confident in navigating through the user interface and accessing the functions of enVision which help in the calibration and maintenance of X-Series systems. Execution of the instrument families associated checker, verification, and calibration programs will be explained. Attendees will also be provided with access to systems to ensure they are comfortable and confident in performing the preventative maintenance activities necessary to achieve the maximum reliability.

Course Outline

- System Overview
- System Fundamentals
- Power Distribution and System Interfaces
- DC Voltage and Current Modules
- DSP Baseboard
- Dual Arbitrary Waveform Generator
- Dual Waveform Digitizer (DIG)
- Digital Instruments
- System Diagnostics
- System Maintenance
- LX System Maintenance (upon request)

Course Length

- Four days, including classroom and practical exercises

Recommended Skills

- English - written and spoken

Prerequisites

- None

Who Should Attend

- Test system maintenance engineers and technicians

- **Up to 256/512/1024 digital pins**
- **20/40/80 instrument slot configurations**
- **Comprehensive portfolio of DC, power, DSP, RF and digital power instruments**

X-Series EX/MX Maintenance

Course Modules

1 - System Overview

This unit will introduce the student to the course layout, documents used while in training, certification criteria, ESD awareness, general safety while under training instructions, and a test system overview. Upon completion of this unit, students will be familiar with the EX/MX tester functionality, purpose, capabilities, and bus structure.

2 - System Fundamentals

This unit provides a brief introduction to UNIX, and the Linx System. The student is introduced to enVision essentials, concepts and the skills necessary to operate enVision tools effectively in a maintenance environment including:

- Launching and exiting enVision
- Using maintenance related enVision tools
- Familiarization with basic UNIX commands, file structure and file manipulation
- Working within the Common Desktop Environment (CDE)
- Datalogging results

3 - Power Distribution and System Interfaces

This unit will introduce the power distribution, hardware interfaces, and various system configurations. Upon completion of this unit the student will be able to:

- Recognize different tester configurations, major system subassemblies and the workstation
- Recognize the various system power supplies and power distribution
- Navigate to, load and unload maintenance related programs and files
- Effectively use maintenance related enVision tools
- PCB Slot locations
- System bus structure
- System configuration files
- Powering the EX/MX up and down
- Overview of Calibration and Diagnostics

This unit includes:

- Tester mainframe resource locations
- Tester head architecture
- Instrument location
- Calibration and Diagnostics

4 - DC Voltage and Current Modules

This unit introduces the OVI, VI 16, PPVI, HVVI and HCOVI instruments used by the EX/MX for source and measure functions. Upon completion of this unit the student will:

- Be familiar with the general concepts and the basic functions necessary to perform DC source and measure operations

DSP Instruments

5 - The DSP Baseboard

This unit will introduce the DSP (digital signal processing) Baseboard and its functions. Upon completion of this unit the student will:

- Understand the use and functionality of the DSP Baseboard
- Identify card slot locations for DSP configurations
- Be familiar with application specific rider boards for the DSP

This unit includes:

- Subsystem Interfaces
- Waveform Memory
- Relay Control

6 - The Dual Arbitrary Waveform Generator

This unit will introduce the Dual Arbitrary Waveform Generator (AWG), AWGHR (AWG High Resolution) and AWGHS (AWG High Speed) sourcing instruments.

Upon completion of this unit the student will:

- Understand the functions of the AWGs
- Understand the AWGs' relationship to the DSP
- Understand AWGs' impact on system configuration
- Be familiar with X-Series waveform sourcing options

7 - The Dual Waveform Digitizer (DIG)

This unit introduces the DIG, DIGHR (DIG High Resolution) and DIGHS (DIG High Speed) as the primary measure. Upon completion of this unit the student will:

- Understand the purpose and functions of the Digitizer
- Understand the relationship of the DIG to the DSP Baseboard
- Understand impact of the DIG on system configuration
- Be familiar with measuring operations

- **Up to 256/512/1024 digital pins**
- **20/40/80 instrument slot configurations**
- **Comprehensive portfolio of DC, power, DSP, RF and digital power instruments**

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Course Modules (cont.)

8 - Digital Instruments

This unit will provide an overview of the FX digital subsystem including:

- Overview of the FX digital subsystem
- Location and functions of the FX digital subsystem instruments
- FX Digital subsystem calibration and diagnostics

Upon completion of this unit the student will be able to:

- Perform digital subsystem operations
- Perform diagnostics on the digital subsystem
- Perform maintenance on the digital subsystem

9 - RF Instruments

This unit will introduce the RF subsystem source and measure option. Upon completion of this unit the student will:

- Be familiar with source and measure instruments of the RF subsystem
- Be aware of RF generation sources and subsystem interfaces,
- Be able to maintain and perform RF source and measure operations, and
- Be familiar with RF configuration options available with the X-Series
- Performing diagnostics on the RF subsystem
- Removing/replacing RF instrument modules

10 - System Diagnostics

This unit provides and overview to system diagnostics, including various load boards used with the X-Series tester to include:

- Subsystem Overview
- Cals & Checkers
- RF Diagnostic Kit
- RF Load boards

Upon completion of this unit the student will be able to:

- Perform system diagnostics
- Analyze and interpret test results for accuracy and symptom indications

11 - System Maintenance

This unit introduces basic system maintenance and basic troubleshooting tips including:

- Basic System Maintenance
- Preventive Maintenance
- System Instrument Slot Locations
- FRU removal/replacement
- Troubleshooting Tips

Upon completion of this unit the student will:

- Understand basic maintenance
- Be familiar with specific card cage slot locations,
- Perform basic and preventive maintenance, and
- Be aware of symptom indications as an aid to system troubleshooting

12 - Appendix A. LX System Maintenance

This unit will be discussed upon request for those customers with LX systems. The common hardware resources and operating system of the X-Series test systems result in maintenance of the LX using the same calibration and checker programs, and field replaceable units as the EX, MX, and CX test systems.

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